Linking procedural memory with organizational learning through knowledge corridors

1. Introduction

In a turbulent environment such as the one where the Spanish banking sector operates, the achievement of higher levels of performance requires the detection and interpretation of ambiguous environmental signals in order for appropriate actions to be taken (Day, 1994; Day & Schoemaker, 2006). Adopting this perspective, if we consider the universe of customers, typically they may be categorised into three different groups namely: valuable, current and potential customers. From the point of view of a company, focal vision allows managers to focus on identifying the needs and wants of valuable customers (Sard, 2000). Thus, well-developed focal vision provides managers with focus and direction for setting operational goals. In addition, knowing specifically what profitable customers want enables managers to build and deliver precise solutions to meet profitable customers' needs (Sherden, 1994). Good focal vision also guides managers in making decisions and establishing what the organisation does best (Sard, 2000).

It should be noted, however, that focal vision has inevitable restrictions. For illustration, in the case of the human eye, focal vision encompasses the central two degrees of vision. This means that although focal vision offers the sharpest view, it also represents a very narrow view of the external visual environment. In contrast, peripheral vision or side vision encompasses what is visible outside the central area of focus (Chevaleraud, 1986). In the context of 'company vision' focal vision is also very narrow and focuses on a small subset of valuable customers while a company's peripheral vision expands vision extensively. It has been noted that companies utilising peripheral vision are often very successful (Day & Schoemaker, 2006). Furthermore, being unaware of peripheral signals can result in the erosion of the firm's competitive position as new competitors enter the fray and new products invade the marketplace but are not perceived or their importance un-assessed or under-assessed (Day & Schoemaker, 2006). Fairclough (2005) further asserts that when organisations ignore the events unfolding on the periphery of their business, they usually experience significant costs and risks.

The term 'knowledge corridors' refers to structures (routines, procedures, values etc.) that provide managers with the opportunity of examining to either reject or adopt new opportunities (Martelo-Landroguez & Cegarra-Navarro, 2014). In this paper, the combinations of factors that facilitate focal and peripheral vision are considered to represent two distinct types of knowledge corridor. These development and utilisation of these corridors potentially allow managers to change the way they interpret their perceptions and, as a result, create new knowledge about potential and valuable customers (Martelo-Landroguez & Cegarra-Navarro, 2014). Thus, knowledge corridors allow organisations to consider alternative interpretations of the information relating to both current and potential customers. There is, however, a possibility for conflicts between interpretations involving knowledge corridors to emerge. There are different ways to balance the tension between knowledge corridors. Burgelman (2002) stated that the balancing -generally referred to as ambidexterity, can arise from the creation of a punctuated equilibrium or through paying sequential attention to exploration and exploitation. Other authors have suggested that such a balance can be achieved through the simultaneous use of both exploration and exploitation (He & Wong, 2004; Jansen et al., 2008; O'Reilly & Tushman, 2008).

This study follows the second of the above approaches to establish ambidexterity and hence proposes that the alignment and parallelism of focal and peripheral visions is as a requisite to organisational learning. In line with the above discussion, the term 'ambidexterity vision' refers to the simultaneous balanced pursuit of knowledge corridors arising from focal and peripheral vision. In order to strengthen the distinct types of vision and thus be able to achieve ambidexterity vision, consistency and unity of purpose, along with organisational rules, routines and procedures where both exploration and exploitation can be supported, become requirements (Moorman & Miner, 1998). These practices and structures may be considered to constitute the "procedural memory" of an organisation (Moorman & Miner, 1998).

This paper examines the significance of procedural memory to an organisation's ambidexterity vision, along with investigating the effects of the development of both types of vision on organisational learning. This study addresses the following two questions: (1) Does the enhancement of the procedural memory of an organisation result in an improved ambidexterity vision? (2) Does the simultaneous development of focal vision and peripheral vision enhances organisational learning?

The remainder of the paper is structured as follows. First, the conceptual framework is discussed and presented in Section 2. Section 3 contains a description of the principal aspects of the methodology used and the data analysis. The theoretical contribution and managerial implications of the study are presented in Section 4. Finally the paper concludes with a discussion of the limitations of the research and potential future research in Section 5.

2. The proposed research model

2.1. Linking Procedural Memory with Organizational learning

Organisational learning may be considered to refer to a set of processes that allow members of an organisation to develop and enhance both their own knowledge and that of the organisation in order to ensure that appropriate actions are taken for an improve efficiency (Marsick, 2013). Furthermore, organisational learning can potentially enhance the firm's competitive advantage (Barney, 1986). The existing research literature suggests that organisational learning processes provides a framework for the necessary exchange of views and understandings between managers and employees and provide for the balancing of the interests of the stakeholder groups along with taking into account the economic welfare of the company (Marsick, 2013; Watkins & O'Neil, 2013). Based on the work of Song, Joo and Chermack (2009), a proposed list of key enablers (organisational structures and factors) that characterise the different components of organisational learning is briefly outlined below:

- Continuous learning: Learning is designed into work so that people can learn on the job.
- Team Learning: Work is designed to use teams to access different modes of thinking; collaboration is valued by the culture and rewarded; teams are expected to learn by working together.
- Embedded systems: Necessary systems to share learning are created, maintained, and integrated with work; employees have access to these high- and low-technology systems.
- Inquiry and Dialogue: The organisational culture supports questioning, feedback, and experimentation; people gain productive reasoning skills which enable them to

express their views and develop their capacity to listen and inquire into the views of others.

In a human context, procedural memory is composed of a set of action rules that provide for the performance of familiar tasks and routines (Anderson, 1983). Procedural memory is considered to be a part of the long-term memory that is responsible for knowing how to do things (Moorman & Miner, 1998), and may be distinguished from episodic memory that can be explicitly stated or conjured (Moorman & Miner, 1998). In common parlance procedural knowledge refers to 'knowledge how' and episodic memory refers to 'knowledge that'. According to Ebbers and Wijnberg (2009), in an organisational context, procedural memory is particularly important as a store of organisation-specific or collective tacit knowledge. In this study, procedural memory refers to the individual or organisational memory that provides workers with access to knowledge learned from past experiences (Tippins & Sohi, 2003). Earlier studies have found a positive relationship between the existence of prior knowledge and organisational learning (Cohen & Bacdayan, 1994; Moorman & Miner, 1998), reinforcing the argument that developing procedural memory contributes to the improvement of organisational learning and the establishing of a foundation for competitive advantage (Ebbers & Wijnberg, 2009).

As noted by Cepeda-Carrion et al. (2012), an increasingly dynamic internal and external environment has resulted in significant risks for organisations, some of which arise from failing to consider the changing nature and importance of knowledge. In addition, there is an increasing risk of losing valuable knowledge due to the higher turnover of employees and the passage of time. In an attempt to avoid these problems, procedural memory and its constituents (e.g. procedures, routines, collective knowledge) are frequently cited as one way to preserve and utilise valuable organisational knowledge (Ebbers & Wijnberg, 2009). In addition to this, a set of procedural practices that enable and encourage employees to do their best at work helps individuals to develop a reasonably clear mental model of the organisation (Cegarra-Navarro & Dewhurst, 2007), while enabling them to stay engaged during any organisational changes which may take place (Cohen & Bacdayan, 1994; Moorman & Miner, 1998).

Based on the above discussion, this research proposes the following hypothesis:

H1: The extent to which procedural memory exists will be positively related to the level of organisational learning in the company

2.2. Linking Procedural Memory to an Ambidexterity Vision

In an organisational context, routines and standard approaches can speed up actions and enhance efficiency through the reduction of search costs, focusing attention, and the limiting of politicking in familiar settings (Walsh & Ungson, 1991). However, it is likely that some of the knowledge associated with procedural memory is based on past activities that are no longer applicable in the current situation or, particularly, with respect to potential customers (Cohen & Bacdayan, 1994; Walsh & Ungson, 1991). When this happens, procedural memory may be considered to particularly impair the effectiveness of improvisational action with respect to novelty because procedural memory, as indicated, is composed of fine-tuned routines and processes based on prior experience that are difficult to modify (Day, 1994). One of the sources of signals indicating that existing procedural memory is not fit for purpose relates to the identification of blind spots in the field of vision of organisational members

caused by existing power relations and mental models (Haeckel, 2004). These blind spots and potential areas of lost vision may well result in elements of procedural memory being incomplete or obsolete (Day & Schoemaker, 2004).

In the case of the human eye blind spots can be counteracted by an appropriate balance between the "fovea" and its "peripheral vision". The fovea is responsible for the sharp focal or central vision that is necessary for activities where visual detail is of primary importance such as reading and driving (Chevaleraud, 1986). In the context of business, focal vision may be considered to address the needs of existing valuable customers (Day & Schoemaker, 2006). Peripheral vision, in contrast, involves perceptions at the boundary of the visual field and its original purpose was to detect movement and change (Mathur et al., 2013). Furthermore, peripheral vision affects both the subsequent focusing of attention and appropriate anticipatory behaviour (Erickson, 2007). It has been noted that in the context of ordinary vision people who do an excessive amount of near vision work may experience a false myopia (Chevaleraud, 1986). False myopia occurs when the eyes' focusing mechanism is over-worked and as a result it loses the ability to refocus quickly, leading to a temporarily blurred peripheral vision (Chevaleraud, 1986).

The above concepts can be valuably extended to the world of business. In an organisational context false myopia can occur when managers become too focused on core measures and short-term objectives (Levitt, 2004; Smith, Drumwright, & Gentile, 2010). In order to correct this false myopia, managers may need to develop capabilities allowing them to expand their field of vision beyond their existing core vision. In fact, most managers are usually focused on their current customer base rather than the broader pool of all potential customers (Day & Schoemaker, 2006; Kakavelakis, 2010). It should be noted, however, that as competition intensifies and the pace of change accelerates, the ability to respond to changes in the needs of existing customers and identify new customers can become vital to the success or indeed survival of the firm (Day & Schoemaker, 2006; Léger, 2010; Zaragoza-Sáez & Claver, 2011).

The above considerations lead to a conclusion that managers and the organisations they manage are often focused completely on a number of key customers, issues and short-term targets, such as profits and market share (Sherden, 1994; Cegarra-Navarro & Rodrigo, 2003). While this focus may be fundamental to effective knowledge exploitation, it may likely to come with the risk of suboptimal or even non-existent exploration of knowledge (Day & Schoemaker, 2004). For example, it may lead to an underestimation of events and activities taking place at the periphery, outside the focus of attention. These events and activities may be critical to the success and, indeed, even the survival of the firm. This may well prevent the development of explorative knowledge models and strategies (Haeckel, 2004). Furthermore, attending to the periphery allows for the detection of changing tastes and needs and the potential identification of new customers and new value-adding activities (Day & Schoemaker, 2004). Therefore, by focusing only on valuable customers, companies may fail to appreciate less immediate opportunities and threats from the periphery where potential or valuable future customers may be located (Haeckel, 2004).

Most studies in the subject of organisational learning emphasise the need to develop several knowledge corridors in parallel as well as creating an effective balance between them. As noted above, this may be considered to involve the balancing of perspectives related to focal and peripheral vision. Since organisational learning needs both to explore new possibilities to ensure profits for tomorrow and exploit old existing opportunities for profits for today (March, 1991; Argyris & Schön, 1996; Crossan et al., 1999; Gavetti & Levinthal, 2000;

Volberda & Lewin, 2003), we now face the dilemma of finding mechanisms to allow for knowledge sharing by investigating technological and organisational factors that affect both peripheral and focal vision simultaneously. Some authors have argued that such knowledge sharing can arise from using technologies to understand information and support communication efficiency (e.g. Del Giudice & Della Peruta, 2016; Landaeta et al., 2016; Soto-Acosta & Cegarra-Navarro, 2016). Other authors suggest that knowledge sharing requires the resolute support by top management and well-motivated employees (e.g. Bolisani & Scarso, 2016; Martinez, Soto-Acosta & Carayannis, 2017).

This paper adopts a knowledge-based perspective of peripheral vision, focal vision and insights gained through an understanding of procedural memory as a prerequisite for the development of complementary knowledge corridors (Martelo-Landroguez & Cegarra-Navarro, 2014). Such complementary knowledge corridors allow managers to make their own judgments about how to divide their time between growing customer demands for alignment and adaptability (Tushman & O'Reilly, 1996; He & Wong, 2004). Given the essential nature of procedural memory, not only will procedural memory need to be regularly updated through the company's ambidexterity vision but also its ambidexterity vision needs to be enhanced through interaction with the company's procedural memory. Through accessing procedural memory, employees are able to interact with colleagues (Ebbers & Wijnberg, 2009), discover what goes wrong and how things can be improved in different parts of the organization (Cohen & Bacdayan, 1994), and use knowledge learned from past experiences (O'Reilly & Tushman, 2013). Thus, the company's procedural memory allows for the identification of new opportunities, the identification of both risks and growth prospects related to the company's peripheral vision, e.g. the company's ability to predict the future needs of potential customers. Furthermore, procedural memory helps the organisation realise ways in which competitive advantage can be derived from current business operations and the identification of existing customers unfulfilled needs.

Based on the above discussion this research proposes the following additional hypotheses:

H2: The extent to which procedural memory exists will positively determine an organisation's ability to develop its focal vision

H3: The presence of procedural memory will positively determine an organisation's ability to develop its peripheral vision

2.3. Linking an Ambidexterity Vision and Organisational Learning

The concept of a knowledge corridor has been used to refer to the way in which prior knowledge facilitates the opening up of a corridor to future opportunities and options (Shane, 2000). It should be noted that the use of the term "knowledge corridor" is in accordance with Ronstadt's (1988) corridor principle, which posits the proposition that opportunity recognition is assumed to be a function of both a person's stock of knowledge and previous social knowledge. For example, exposure to work experiences from other organisational members will broaden an entrepreneur's perceptual range of feasible opportunities for developing and enhancing business (Krueger, 2007). From this point of view, knowledge corridors become locations where powerful leaders or members of the organisation interact with external knowledge (Martelo-Landroguez & Cegarra-Navarro, 2014). Such knowledge corridors can be considered to provide ways of exploring and structuring an organisation's future course of action (Martelo-Landroguez & Cegarra-Navarro, 2014). In other words,

knowledge corridors provide for the development of a path that allows for the exploration and deployment of assimilated knowledge (Short et al., 2009). It can be further argued that knowledge corridors are an integral component of House et al.'s (2002) notion of organisational culture.

Based on the above considerations it can be argued that both peripheral vision and focal vision are related to different knowledge corridors. While peripheral vision is related to the exploration of new opportunities with new clients, focal vision is related to the organisation's capacity for exploiting business opportunities with existing customers (Cegarra-Navarro et al., 2016). As Pina e Cunha and Chia (2007) have noted, the use of peripheral vision can lead to the identification of new opportunities and growth prospects. In this regard, one stream of research that addresses organisational learning considers that the learning organisation may require the development of an effective balance between explorative and exploitative structures to create consistency and unity of purpose, along with an environment where both exploration and exploitation can be sustained (e.g. Gibson & Birkinshaw, 2004; He & Wong, 2004; Cegarra-Navarro & Dewhurst, 2007; O'Reilly & Tushman, 2008).

An ambidexterity vision that has the objective of stimulating organisational learning should promote knowledge sharing across the organisation, encouraging the use of different types of knowledge and different learning processes (Menon & Varadarajan, 1992). Thus, an ambidexterity vision could fosters organisational learning when it supports flexibility of organisation procedures, increases participation in the decision-making process and promotes values such as risk-taking and support for creative failure (Amabile, 1998). This specific type of culture allows managers to attain their objectives (Sánchez-Quirós, 2009) and fosters continuous improvement of existing processes (Gallego & Gil, 2012). In addition, it favours organisational flexibility, which helps individuals to adapt their tasks and procedures to the changing targets that result from organisations having to compete in turbulent markets (Nicholls, 1994; Mackenzie, 1995). In order to examine the link between ambidexterity vision and the integration of peripheral and focal vision the following hypotheses are explored:

Hypothesis 4: Peripheral vision corridors are positively related to organisational learning.

Hypothesis 5: Focal vision corridors are positively related to organisational learning.

Figure 1 provides an summary outline of the above arguments. As in a partial mediation model, the independent variable influences the dependent variable directly and indirectly via the other variables. In our approach, the model assumes that the extent to which procedural memory exists affects the levels of organisational learning directly and indirectly via both the focal and peripheral vision. The existing research literature suggests that the existence of knowledge corridors provides a framework for the necessary exchange of views between managers and customers (both current and potential) and provides for the balancing of the interests of the stakeholder groups with each other and with the economic welfare of the company. From this perspective, the balance between focal vision and peripheral vision may become a trigger for organisational learning. This is because such a balance provides new ideas and concerns which lead to raised awareness among relevant stakeholders (e.g. managers and employees) of the importance of acquiring, assimilating, transforming and exploiting knowledge from both potential customers and existing valuable customers.

Insert Figure 1 about here

3. Method

3.1 Data collection

The population used to provide a sample as a basis for testing the hypotheses proposed in this paper comprised branch managers from a Spanish bank. With a network of 2,000 branches, this is the largest Spanish bank with respect to domestic business, with total assets exceeding 272,000 million Euros and a net equity value of 12 billion Euros; it employs 14,500 people and has a strong international presence with offices in Beijing, Dublin, Lisbon, London, Miami, Milan, Munich, Porto, Paris, Shanghai, Warsaw and Vienna. The bank made progress in key aspects of its business in 2015 and 2016. In the investment fund business, for example, the bank gained 24 basis points of market share in 2016 year, bringing the share to 4.98%. Before conducting the surveys, managers from 690 branches with more than six employees in Spain were contacted and asked by our team to participate in the study. They were informed through a formal letter of the objectives of the research and they were assured of its strictly scientific and confidential character, as well as the global and anonymous treatment of the data.

In total, 690 managers were invited to participate in the study and a total of 203 of them agreed, which resulted in a response rate of 29.42%. This is greater than the average response rate of 15 to 25 per cent suggested by Menon, Bharadwaj and Howell (1996) for surveys involving senior management. The survey was administered over a period of two months, from early January to early March 2016, with a factor of error of 5.77% for p=q=50% and a reliability level of 95.5%. The researchers have tested for common method bias that is a potential risk arising from the use of a single informant when collecting data in each company (Podsakoff et al., 2003). The authors used factor analysis, the recommended way of testing for the existence of bias. All variables were analysed in order to ensure that there was only one important factor. The results showed seven factors with eigenvalues greater than 1.0 and the total variance explained was 69.29%. Therefore, non-response bias was not considered to be a problem in this study (Armstrong & Overton, 1977).

3.2 Measures

Churchill's (1979) approach to questionnaire development was used, combining scales from several other relevant empirical studies with new items to make an initial list of 28 items. Several items were modified through interviews with colleagues and a first draft of the questionnaire was tested with three bank branches of the bank. The questionnaire constructs were operationalised and measured as follow (see Appendix for a list of items):

a) Previous studies by Day and Schoemaker (2006) provide guidance in developing items to measure peripheral and focal vision. Four items assessed the importance of 'peripheral vision' to cognitively aware managers relates to enhancement of technical, administrative and social strategies through the accurate understanding of the information available to potential customers. With respect to focal vision, four items highlight the way management faced up to change, actively introduced it into the company through projects, and fostered collaboration with profitable customers of the organisation.

b) Organisational learning was assessed using the scale developed by Song et al. (2009), who used the instrument "Dimensions of Learning Organisation Questionnaire"

(DLOQ) in order to measure the culture of organisations that learn and their results (Egan et al., 2004). It should be noted here that organisational learning was measured as a second order construct composed of four first order constructs making up the scales: Continuous Learning, Inquiry & Dialogue, Team Learning, and Embedded System. Five items assessed the intensity and direction of efforts expended in work-based learning and gauged the extent to which managers were able to support Continuous Learning (CL) on the job. Six items measured Inquiry & Dialogue (ID) and assessed the extent to which firms were able to facilitate questioning, feedback and experimentation. Five items assessed the intensity of Team Learning (TL) and gauged the extent to which teams were able to access different modes of thinking and collaboration. Five items measured Embedded System (ES) and assessed the extent to which necessary systems are created, maintained, and integrated with work.

c) Procedural memory has been measured using Tippins and Sohi (2003)'s scale comprising a reflective construct with 5 items from which one item was deleted. The items relate to knowledge about routines, processes, and procedures. As, for instance, procedures to meet the demands of its customers.

d) This study considers gender as a control variable to verify whether the hypothesised relationships still hold even after controlling for this variable. Such a design decision is justified by the fact that gender can be associated to feelings of engagement (Kraus et al., 2011).

3.3 Data analysis

This study uses PLS-Graph software version 3.0 to conduct an analysis of the data collected. Using PLS involves following a two-stage approach (Barclay et al., 1995). PLS was selected due to the characteristics of the model and the population sample that can be shown to meet Chin's (2010) criteria. Namely, the proposed model is complex and uses reflective indicators, and the data collected is non-normal. Other techniques of structural equation modelling (e.g. the covariance-based model performed by LISREL or AMOS) cannot be applied in these circumstances (Chin, 2010; Hair et al., 2013). In the first step the assessment of the measurement model was evaluated. This allows the relationships between the observable variables and theoretical concepts to be specified. This analysis is performed in relation to the attributes of individual item reliability, construct reliability, average variance extracted (AVE), and discriminant validity of the indicators of latent variables. In the second stage, the partially mediated model was evaluated. The objective of this evaluation was to test the extent to which the causal relationships specified by the proposed model were consistent with the available data. For hypothesis testing, this study used the bootstrapping procedure recommended by Chin (1998).

To analyse the relationships between the different constructs and their indicators, the research adopted the latent model perspective in which the latent variable is understood to be the cause of the indicators. The authors therefore refer to reflective indicators for first-order constructs or dimensions. Three constructs in the model are operationalised as first-order reflective constructs (i.e. peripheral vision, focal vision and procedural memory), while organizational learning was modelled as a second-order reflective construct. With regard to the measurement model, the authors began by assessing the individual item reliability (Table 1). The indicators exceed the accepted threshold of 0.7 for each factor loading (Carmines & Zeller, 1979).

Insert Table 1 about here

From an examination of the results shown in Table 2, it can be argued that all of the constructs are reliable. The values for both the Cronbach's alpha coefficient and composite reliability are greater than the 0.7 required in the early stages of research and the stricter value of 0.8 for basic research (Nunnally, 1978). The AVE should be greater than 0.5, meaning that 50% or more variance of the indicators should be accounted for (Fornell & Larcker, 1981). All the constructs of our model exceed this condition (Table 2). To assess the discriminant validity, the square root of the AVE (the diagonal in Table 2) was compared with the correlations between constructs (the off-diagonal elements in Table 2). On average, each construct relates more strongly to its own measures than to others.

Insert Table 2 about here

As noted above, second-order confirmatory factor analysis was conducted on a model depicting the constructs of Continuous Learning, Inquiry & Dialogue, Team Learning and Embedded System. From an examination of the results shown in Table 3, all first-order and second-order factor loadings were significant. In addition to this, organisational learning (OL) explains a high amount of variance in their respective processes (i.e. CL, ID, TL and ES), thereby providing evidence that OL is a multifaceted construct, construed from four dimensions (i.e. CL, ID, TL and ES).

Insert Table 3 about here

3.4 Results

Since PLS makes no distribution assumptions in its parameter estimation, traditional parameter-based techniques for significance testing and modelling were used for this study (Chin, 1998). Following the recommendations of Dinç (2015) and Hayes and Preacher (2014), a first test was conducted using sequential chi-squared difference tests in order to understand whether a more restricted model worsened the fit. This was performed by using the partially and fully mediated models in which procedural memory was found to affect organisational learning directly and indirectly via the peripheral and the focal visions. Such models were compared with a fully mediated model where procedural memory influences organisational learning through the peripheral and the focal visions. Thus, a test was conducted with a view to understand whether an even more restricted model worsened the fit.

Figure 2 summarises structural competing links, with the standardised path coefficients (β) and the variance of endogenous variables (R^2) being also included in the Figure. Chin's F^2 ratio (1998) indicates a significant improvement of the partial mediation model over the fully mediation model ($\Delta R^2=5.9;\ F^2= .10$). Such an improvement is significant in those cases where F^2 is greater than $.02$. As shown in Figure 2, a comparison between the two models permits the conclusion that the partially mediated model fits better to the observable data than the fully mediated model. This means that there is strong support for a model where most but not all the knowledge associated with procedural memory is channelled through peripheral and the focal vision. Figure 2 also illustrates that the relationship between gender and the variables considered in this study was statistically insignificant in both models.

Once the properties of the models had been checked, the next step was the evaluation of the hypothesised relationships developed from consideration of relevant literature. A positive

relationship was found between the procedural memory and the organisational learning (a_1=.284, p<.01). In addition, positive relationships were found to exist between the procedural memory and the focal vision (a_2=.477, p<.01) and between procedural memory and peripheral vision (a_3=.500, p<.01). As illustrated in the partially mediated model, the relationship between focal vision and organisational learning was statistically significant (a_4=.211, p<.05). Finally, peripheral vision had a significant effect on organizational learning at a level of (a_5=.270, p<.01).

Insert Figure 2 about here

Following the recommendations of Preacher and Hayes (2008), the authors carried out a post-hoc indirect effect analysis to test the indirect effect of procedural memory on organisational learning by way of peripheral and the focal vision (Table 4). This involved the construction of a bias-corrected confidence intervals (CI) around the coefficient of the indirect effect using the SPSS MEDIATE macro and a bootstrapping technique (Hayes & Preacher, 2014; Preacher & Hayes, 2008). This can be justified by the fact that the bias corrected limits may have slightly elevated error rates (Fritz et al., 2012; Hayes & Scharkow, 2013). Therefore, if the 95% CI surrounding the standardized indirect effect did not include 0, we deemed the indirect effect significant. As Table 4 shows, focal vision does not mediate the relationship between procedural memory and organizational learning. However, the indirect effect of procedural memory on the affective commitment via peripheral vision was 0.135 (i.e. 0.500*0.270), which is statistically significant as the bootstrap interval does not contain the zero value.

From the above analysis it is concluded that hypotheses 1, 2, 3 and 5 found support, while hypothesis 4 was partially supported because, though the direct relationship of the relationship was significant as hypothesised, the indirect relationship was not significant.

Insert Table 4 about here

4. Discussion

Banks and other players in the highly competitive financial industry have recognised that knowledge is critical to their success (Martelo-Landroguez & Cegarra-Navarro, 2014). In order to create competitive advantage, the primary knowledge that needs to be shared is about customers (Kakavelakis, 2010), not only with respect to up-to-date client contacts and their relevant preferences and characteristics, but also other knowledge relating to the identification of new customers or the identification of threats and opportunities in emerging markets to provide fresh services and products for current and potential customers (Léger, 2010; Zaragoza-Sáez & Claver-Cortés, 2011). Although it seems intuitively clear that knowledge corridors based on peripheral and focal vision may result in actions related to the objectives and goals of the organisation, they clearly lead to different outcomes. While knowledge corridors based on peripheral vision encourage the utilisation of the information to make sense of the changes in its environment, to create new knowledge supporting innovation, and to reorient the course of the company's future action, knowledge corridors based on focal vision relate to exploitation of current knowledge in the organisation for getting things done faster, cleaner and cheaper (Day, 1994; Day & Schoemaker, 2006; Sherden, 1994).

This study represents an extension of the existing relational learning models through the addition of both valuable current and potential future customers as sources of knowledge for ensuring the enhancement of appropriate learning processes. This was achieved by comparing both the partially and fully mediated models (in which procedural memory influences organisational learning directly and indirectly via peripheral and the focal vision) with a fully mediated model (where procedural memory influences organisational learning through peripheral and the focal vision). The partially mediated model fitted better than a likely alternative model with no direct effects of procedural memory. The results of these links fully support the first hypothesis, which means that most but not all the effects associated with procedural memory are channelled through peripheral and focal vision. This ties in with the views adopted by Ebbers and Wijnberg (2009) when they argued that making use of appropriate procedural knowledge results in avoidance in learning the same lesson twice.

Regarding hypotheses 2 and 3, the results show a significant relationship between procedural memory and focal vision, and also between procedural memory and peripheral vision. This means that procedural memory is linked to increased use of peripheral and focal vision. This would lead to the conclusion that procedural memory not only supports the understanding of routines, processes, and procedures of the company, but also allows for the appreciation the subtle nuances of customers and their thought processes. This confirms the position adopted by Anderson (1983) and Moorman and Miner (1998) when they argued that knowledge that builds on a company's existing procedural memory is useful for conveyance of information to customers. From this perspective, the company's knowledge corridors will enable potential and existing customers to share their concerns, needs, perceptions and understandings with managers with an aim to support an ambidexterity vision. This could encourage internal stakeholders (e.g. managers and employees) to focus on customers' concerns, needs, perceptions and understandings to facilitate the search for unique value creation opportunities and relate them to the organisation's learning needs (e.g. strategic direction).

The results of this study also support the argument that although the direct relationship was significant as hypothesised, the indirect relationship was not significant. Therefore, the findings provide partial support for H4 and suggest that although the enhancement of an organisation's procedural memory helps improve its relationships with valuable customers, the knowledge acquired from these relationships does not necessarily lead to the updating of procedures, routines, collective knowledge. However, our data revealed that the effect of procedural memory on organisational learning is partially mediated through the presence of peripheral vision, which means that most, but not all, procedural memory may be based on past activities that are no longer applicable in current situations or with potential customers (Walsh & Ungson, 1991; Cohen & Bacdayan, 1994). Therefore, results totally confirm H5 and support the proposition that a portion of outdated knowledge may be channelled through peripheral vision. When that happens, the knowledge learned from potential customers is an important trigger for updating procedural memory as it contributes to a process whereby new initiatives and ideas are received from potential customers (Day & Schoemaker, 2004; Haeckel, 2004).

The links associated with gender in the model provide somewhat surprising results. The link between gender and the variables studied in this study are statistically insignificant in all cases. This contradicts the belief in the literature that gender can be associated to feelings of engagement (Kraus et al., 2011). A possible explanation for this result would be the fact that knowledge corridors relate to equality between women and men with respect to their accesses to customer information. However, although men and women have the same opportunities to

access customer information, this idea cannot be extrapolated to contexts such as the gender pay gap or the presence of women on corporate boards (Mauleón et al., 2014). Therefore, future research will need to include these control variables to guarantee this equality between women and men.

Much has been written about why ambidexterity is important in the management of knowledge in an organisational context (e.g. He & Wong, 2004; Jansen et al., 2008; O'Reilly & Tushman, 2008). However, the role played by the company's ambidexterity vision has been both underestimated and underexplored. Although the company's ambidexterity vision and its role in the development of organisational learning provides many opportunities, the role of ambidexterity vision in supporting the learning process has only recently become a source of debate. This paper explores this term, defined as "the state of being equally adapted in the use of both distance and near vision, and also in using them at the same time". Therefore, an important contribution of this research to the debate on ambidexterity has been achieved by providing guidance to management with respect to the implementation of the company's ambidexterity vision. In terms of managerial implications, this work suggests that the re-direction of managers' perceptions to an ambidexterity vision is likely to result in an improvement in their ability to identify emerging trends, newly emerging customers and potential shifts in customer needs and tastes.

Our results support the proposition that a company's ambidexterity vision depends to a significant extent on the characteristics of its procedural memory. It can be therefore proposed that bank managers need to learn from existing procedures, which in turn help them to find solutions to problems. A possible explanation to this finding would be the fact that procedural memory provides managers with some control over what is being done to accommodate both valuable current and potential future customers. Given the limited resources available for predicting the needs and tastes of existing and potential customers (Haeckel, 2004), bringing together focal and peripheral vision will allow for the identification of key areas to focus on. This confirms the position adopted by Day and Schoemaker (2006) when they argued that the interactions and connections that firms build with outside organisations can strengthen their peripheral vision and improve the effectiveness of their focal vision. This also means that managers would benefit from developing 'innovative corridors' of communication with interested customers in order to encourage the further development of ambidexterity vision.

5. Conclusions

This study has examined the significance of procedural memory to an organisation's ambidexterity vision, as well as the impact procedural memory on organisational learning. Our findings reflect the need for managers to better understand the importance of an ambidexterity vision for an improved performance. Such performance would also benefit from achieving a combination of alignment and adaptability arising out of the tension between peripheral vision and focal vision. The enhancement of an organisation's ambidexterity vision not only leads to identification of a wider range of opportunities and threats. It can also help organisations to diagnose and improve operational problems, which in turn, is likely to have a positive effect on updating procedural memory. Furthermore, the knowledge derived as a result of an organisation developing its ambidexterity vision can lead to a rapid reconfiguration of the learning process in response to a wide range of opportunities and threats leading to a more successfully adaptation to the customer needs (Haeckel, 2004).

Another interesting contribution of this study has been the study of procedural memory in its indirect link to organisational learning, as well as the respective weights that can be placed upon peripheral and focal vision. In this aspect, our results suggest that while the indirect effect of procedural memory on organisational learning via focal vision is statistically insignificant, the indirect effect of procedural memory on the affective commitment via peripheral vision was statistically significant. In other words, procedural memory and its components (e.g. procedures, routines or collective knowledge) is focused on gaining new customers rather than retaining existing customers. A plausible explanation for this finding is that bank managers can attract potential customers by offering services and increasing deposits in physical capital, organisational loans and credits. This would allow for the banks' performance to grow in a turbulent context such as the Spanish banking sector during the period that we have examined. In order to reach these goals, opportunities for attracting potential new customers are a necessary tool for learning and improving the efficiency of branch staff on providing these new services. Hence it may be observed that banks, and in particular savings banks, in Spain are offering special offers for new clients. In other words, bank strategies are focused on gaining new customers rather than retaining clients.

Future research might profitably sample a range of companies to investigate the balance between peripheral and focal vision and how it relates to organisational performance. As a limitation to our work, it must be acknowledged that we have assumed that while peripheral vision comes from understanding the changing preferences of potential customers, focal vision focuses only on understanding the preferences of certain valuable customers. In other words, we do not include the possibility of managers being able to consider the value of paying attention to actors and participants other than existing and potential customers. This assumption should be reviewed and explored. It would also be interesting to observe whether there are variations in the learning process through the gathering and analysis of data sets in other contexts (in terms of both sector and country). Future research can valuably focus on carrying out more extensive empirical testing of this model in order to establish its validity and impact on organizational management and organisational performance.

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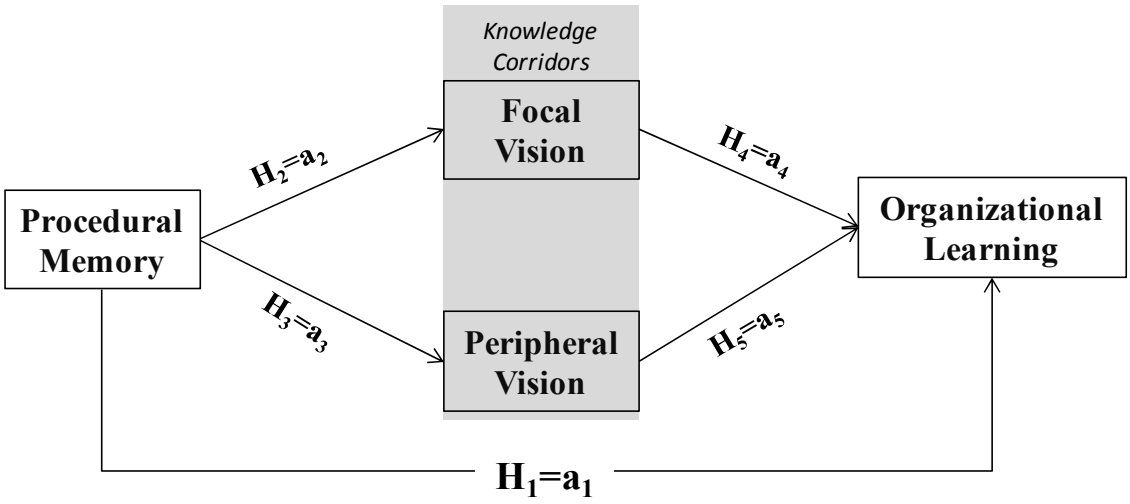
Appendix: Questionnaire items

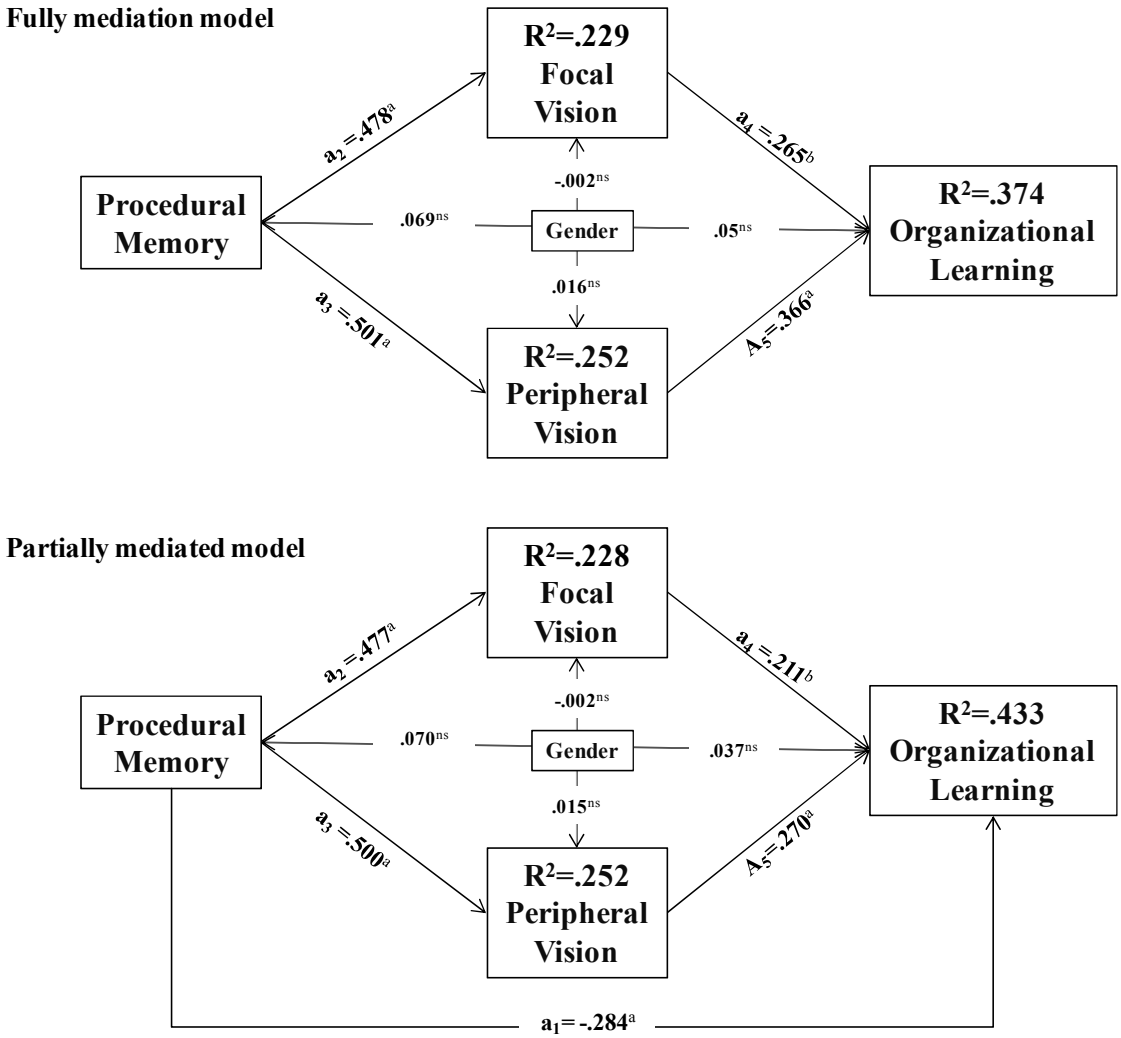
Procedural Memory: with respect to your current position indicate the degree of agreement or disagreement (1= high disagreement and 7= high agreement):
PM1: There is a standard procedure to meet the demands of its customers PM2: It has been learned from past experiences on how to deal with conflicting clients PM3: It has standard procedures followed to determine the needs of their customers PM4: The ombudsman service is effective to treat customer complaints (Source: Tippins & Sohi, 2003)
Peripheral Vision: with respect to your organisation, indicate the extent to which you agree or disagree (1= strongly disagree and 7= strongly agree):
PV1: Managers seem to be open to new ideas of potential customers. PV2: Management has tried to initiate innovations focused on potential customers. PV3: Managers adopt the suggestions of peripheral customers in the form of new routines and processes. PV4: Managers are prone to collaborate with other companies and to solve potential customers´ problems together. (Source: Day & Schoemaker 2006)
Focal Vision: with respect to your organisation, indicate the extent to which you agree or disagree (1= strongly disagree and 7= strongly agree):
FV1: Managers seem to be open to new ideas of valuable customers. FV2: Management has tried to initiate innovations focused on valuable customers. FV3: Managers adopt the suggestions of valuable customers in the form of new routines and processes. FV4: Managers are prone to collaborate with other companies and to solve valuable customers´ problems together. (Source: Day & Schoemaker 2006)
Continuous Learning: with respect to your organisation indicate the extent to which you agree or disagree (1= strong disagreement and 7= strong agreement):
CL1: Employees openly discuss mistakes in order to learn from them. CL2: Employees identify the skills needed for future work tasks. CL3: Employees help each other to learn. CL4: Employees can get support for an external learning. (Source: Adapted from Song, Joo, & Chermack 2009)
Inquiry and Dialogue: with respect to your organisation indicate the extent to which you agree or disagree (1= strong disagreement and 7= strong agreement):
ID1: Open and honest feedback is provided to all other employees. ID2: Employees listen to the views of others before speaking. ID3: Employees are encouraged to ask why, regardless of rank. ID4: When employees give their view, they also ask what others think. (Source: Adapted from Song, Joo, & Chermack 2009)
Team Learning: with respect to your organisation indicate the extent to which you agree or disagree (1= strong disagreement and 7= strong agreement):
TL1: Employees are free to adjust their goals as needed. TL2: Employees treat their members as equals, regardless of rank, culture or other differences. TL3: Employees focus on the tasks of the group and how well the group works. TL4: Employees revise their thoughts as a result of the group discussion or information collection. (Source: Adapted from Song, Joo, & Chermack 2009)
Embedded System: with respect to your organisation indicate the extent to which you agree or disagree (1= strong disagreement and 7= strong agreement):
ES1: Employees have all the necessary information on hand ES2: Maintain an updated database about activities of employees. ES3: Create measurement system related to current and expected returns. ES4: Make its lessons learned available. (Source: Adapted from Song, Joo, & Chermack 2009)

Figure 1: The Proposed Theoretical Model



Source: Own elaboration

Figure: 2 Structural equation models



Notes: [a] <.01; [b] <.05; ns = not significant (based on a Student t (4999) distribution with one tail). t(0.05, 4999) = 1.645; t(0.01, 4999) = 2.327

Table 1: Factor Loadings of reflective constructs

	PM	PV	FV	CL	ID	TL	ES
PM1	***.753***	.386	.358	.430	.331	.315	.416
PM2	***.778***	.357	.323	.401	.313	.315	.331
PM3	***.849***	.433	.429	.415	.394	.354	.291
PM4	***.799***	.415	.401	.358	.286	.242	.371
PV1	.425	***.837***	.680	.409	.450	.498	.415
PV2	.469	***.872***	.691	.390	.376	.394	.417
PV3	.396	***.874***	.755	.345	.371	.439	.430
PV4	.446	***.882***	.791	.467	.463	.503	.447
FV1	.403	.750	***.856***	.287	.351	.422	.429
FV2	.452	.713	***.883***	.436	.406	.454	.489
FV3	.451	.762	***.904***	.398	.383	.468	.473
FV4	.368	.737	***.866***	.411	.387	.479	.512
CL1	.405	.288	.283	***.856***	.575	.505	.331
CL2	.438	.445	.435	***.895***	.629	.578	.411
CL3	.421	.397	.336	***.837***	.671	.526	.284
CL4	.428	.442	.421	***.778***	.561	.518	.455
ID1	.441	.417	.343	.637	***.869***	.618	.348
ID2	.359	.458	.379	.677	***.870***	.641	.266
ID3	.332	.392	.368	.614	***.881***	.681	.394
ID4	.331	.418	.434	.604	***.878***	.687	.369
TL1	.220	.407	.396	.357	.436	***.773***	.306
TL2	.321	.455	.447	.519	.658	***.870***	.332
TL3	.367	.497	.482	.622	.731	***.939***	.479
TL4	.384	.462	.457	.623	.705	***.916***	.442
ES1	.349	.366	.431	.363	.338	.377	***.761***
ES2	.362	.461	.486	.375	.304	.385	***.855***
ES3	.376	.371	.386	.275	.252	.279	***.775***
ES4	.344	.398	.448	.395	.370	.435	***.844***

Notes:
Procedural Memory → PM, Peripheral Vision → PV, Focal Vision → FV, Continuous Learning → CL, Inquiry & Dialogue → ID, Team Learning → TL, Embedded System → ES,

Table 2: Descriptive Statistics and Correlation Matrix

	Mean[a]	SD	CA	CR	AVE	1	2	3	4	5	6	7	8
1. PM	5.259	1.015	.806	.873	.633	***.795***							
2. PV	4.337	1.245	.889	.923	.750	.498	***.866***						
3. FV	4.425	1.200	.900	.930	.770	.471	.844	***.877***					
4. CL	4.951	1.288	.863	.907	.710	.507	.468	.437	***.842***				
5. ID	4.713	1.442	.897	.929	.765	.416	.478	.434	.720	***.874***			
6.TL	4.291	1.464	.824	.884	.655	.379	.535	.523	.619	.741	***.809***		
7. ES	3.675	1.547	.806	.873	.633	.285	.435	.406	.438	.548	.615	***.795***	
8. OL	4.407	1.209	*n.a.*	*n.a.*	*n.a.*	.465	.568	.534	.808	.890	.885	.786	***n.a.***

Notes:

Mean = the average score for all of the items included in this measure; S.D. = Standard Deviation; CA = Cronbach's Alpha; CR = Composite Reliability; AVE = Average Variance Extracted; n.a. = not applicable. They represent the dimensions of each second-order construct. The bold numbers on the diagonal are the square root of the Average Variance Extracted. Off-diagonal elements are correlations among construct [Procedural Memory → PM, Peripheral Vision → PV, Focal Vision → FV, Continuous Learning → CL, Inquiry & Dialogue → ID, Team Learning → TL, Embedded System → ES, Organizational Learning → OL]

Table 3: Second-order confirmatory factor analysis of Organizational Learning

First-order construct		First-order		Second-order	
	Indicator	Loading	t-value	Loading	t-value
CL R^2=0.735	**CL1**	0.856	30.840	0.857	36.128
	CL2	0.895	50.726		
	CL3	0.837	27.992		
	CL4	0.778	25.165		
ID R^2=0.803	**ID1**	0.869	40.022	0.896	57.786
	ID2	0.870	29.228		
	ID3	0.881	41.167		
	ID4	0.878	35.289		
TL R^2=0.774	**TL1**	0.673	13.354	0.880	47.257
	TL2	0.870	32.726		
	TL3	0.939	102.20		
	TL4	0.919	79.728		
ES R^2=0.416	**ES1**	0.761	16.242	0.645	9.976
	ES2	0.855	36.782		
	ES3	0.775	17.262		
	ES4	0.844	30.634		

Notes:
Continuous Learning → CL, Inquiry & Dialogue → ID, Team Learning → TL, Embedded System → ES

Table 4: Indirect effects

Indirect effects on	Point estimate	Percentile bootstrap 95% confidence interval		
		Lower	Upper	p-value
Organizational Learning				
$PM \rightarrow FV \rightarrow OL = a_2 \times a_4$	.100[ns]	-.053	.216	.237
$PM \rightarrow PV \rightarrow OL = a_3 \times a_5$	.135[a]	.070	.335	.004

Notes:
[a] <.01; [b] <.05; ns = not significant [Procedural Memory → PM, Peripheral Vision → PV, Focal Vision → FV, Organizational Learning → OL]